

CLAIMS

1. In a mobile station adapted for slotted operation on a current wireless communications system, a method for acquiring a wireless communications system comprising the steps of:

during a slot-off period, analyzing a signal received on a channel associated with a candidate communications system;

determining, based on the analysis of the received signal, whether the candidate communications system is likely to be available for acquisition by the mobile station; and

attempting to acquire the candidate communications system if it is determined that the candidate communications system is likely to be available for acquisition.

2. The method of Claim 1 further comprising the step of selecting a set of candidate communications systems, wherein the step of analyzing is repeated for each candidate communications system in the set.

3. The method of Claim 2 wherein, for each candidate communications system in the set, the step of analyzing comprises the steps of:

switching to a channel associated with the candidate communications system;
and

testing the received signal.

4. The method of Claim 3 wherein, for each candidate communications system in the set, the steps of switching and testing are completed during a single slot-off period.

5. The method of Claim 3 wherein, if the time remaining in the current slot-off period is insufficient to complete the steps of switching and testing for the current candidate communications system, the mobile station returns to the current communications system until a subsequent slot-off period, and

wherein the step of analyzing is resumed during a subsequent slot-off period.

6. The method of Claim 5 wherein the step of analyzing terminates when a predetermined condition is satisfied.

7. The method of Claim 6 wherein the step of analyzing terminates when a predetermined number of received signals satisfy predetermined testing criteria.

8. The method of Claim 2 wherein each candidate communications system is more desirable than the current communications system.

9. The method of Claim 2 wherein the mobile station includes a table of known communications systems, each known communications system having a relative desirability, and wherein the set of candidate communications systems is selected from the table of known communications systems, and

wherein each candidate communications system in the set has a relative desirability that is greater than the current communications system.

10. The method of Claim 9 wherein a geographic region for each communications system is stored in the table of known communications systems and wherein the set of candidate communications systems includes only known communications systems in the same geographic region as the current communications system.

11. The method of Claim 2 wherein the set of candidate communications systems includes at least one digital communications system and at least one analog communications system.

12. The method of Claim 1 wherein the step of analyzing comprises the step of measuring the strength of the received signal.

13. The method of Claim 12 wherein the candidate communications system is expected to be available if the measured strength of the received signal exceeds a predetermined threshold value.

14. The method of Claim 13 further comprising the step of selecting a set of candidate communications systems, wherein the steps of analyzing and determining are repeated for each candidate communications system in the set.

15. The method of Claim 14 wherein the step of attempting to acquire is performed for each candidate communications system that has a corresponding measured signal strength that exceeds the predetermined threshold value, until a candidate communications system is acquired or the candidate communications systems are exhausted.

16. The method of Claim 15 wherein the step of determining comprises the step of sorting the candidate communications systems in order of measured strength, the sorted order defining the order of attempted acquisition.

17. The method of Claim 15 wherein the step of determining comprises the step of sorting the candidate communications systems in order of desirability, the sorted order defining the order of attempted acquisition.

18. The method of Claim 1 wherein the step of analyzing comprises the step of calculating a ratio E_c/I_o of the received signal.

19. The method of Claim 18 wherein the candidate communications system is expected to be available if the calculated ratio E_c/I_o exceeds a predetermined threshold value.

20. The method of Claim 1 wherein the step of analyzing comprises the step of attempting to decode the received signal.

21. The method of Claim 1 wherein the step of analyzing comprises the step of locating a SID and a NID in the received signal, and wherein the step of determining comprises the step of verifying that the located SID and NID match a SID and NID of the candidate communications system.

22. A mobile station comprising:

a communications transceiver that facilitates wireless communications with a base station of a current wireless communications system;

a processing circuitry coupled to the communications transceiver, the processing circuitry controlling a slotted operation mode of the mobile station, the slotted operation mode including:

a slot period during which the processing circuitry instructs the communications transceiver to listen for incoming messages from the current communications system, and

a slot-off period during which the processing circuitry instructs the communications transceiver to listen for a candidate communications system.

23. The mobile station of Claim 22 further comprising:

a memory coupled to the processing circuitry, the memory storing a system table that includes a list of wireless communications systems, each wireless communications system having a relative desirability and an associated geographic region,

wherein the relative desirability of the candidate communications system is greater than the relative desirability of the current communications system.

24. The mobile station of Claim 23 wherein the processing circuitry includes searcher logic to analyze a signal received during the slot-off period and determine, based on the analysis, whether the candidate communications system is likely to be available for acquisition by the mobile station.

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25. The mobile station of Claim 24 wherein the processing circuitry initiates an attempt to acquire the candidate communications system if it is determined that the candidate communications system is likely to be available for acquisition.

26. In a wireless device, an integrated circuit comprising:
a control processor including logic for controlling a slotted operation mode of the wireless device, the slotted operation mode including:

a slot period during which the control processor instructs the wireless device to listen for incoming messages from a current wireless communications system, and

a slot-off period during which the control processor instructs the wireless device to enter a sleep mode;

a system determination unit coupled to the control processor, the system determination adapted to identify candidate communications systems in a current geographic region of the wireless device that are more desirable than the current wireless communications system; and

a searcher coupled to the control processor and system determination unit, the searcher adapted to analyze a signal quality of at least one of the identified more desirable communications systems, wherein the measurement of each more desirable communications system is performed during a single slot-off period.

27. The integrated circuit of Claim 26, wherein the searcher measures the strength of a received signal for each identified more desirable wireless communications system.

28. The integrated circuit of Claim 26, wherein the searcher calculates the ratio E_c/I_o of a received signal for each identified more desirable wireless communications system.

29. The integrated circuit of Claim 26 further comprising a memory coupled to the system determination unit, the memory storing a list of known

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communications systems, each known communications system having an associated geographic region and relative desirability;

wherein the systems analyzed by the searcher are selected from the system table.

30. The integrated circuit of Claim 29 wherein the searcher is adapted to analyze the signal quality of each identified candidate communications system and notify the system determination unit of the results.

31. The integrated circuit of Claim 26 wherein the system determination unit is adapted to transmit an instruction to the searcher, the instruction including a test identifier; and

wherein, in response to a received instruction, the searcher analyzes the signal quality of at least one of the identified more desirable communications systems using a test method identified by the test identifier.

32. The integrated circuit of Claim 31 wherein the transmitted instruction further includes a threshold value, and

wherein the searcher transmits a notification message to the system determination unit when the analyzed signal quality exceeds the threshold value.